1902 he gained a first class in botany in the second part of the Tripos.

In 1904 Mr. Gregory shared the Walsingham medal with the late Dr. Keith Lucas, and in the same year he was elected a fellow of his college. In 1907, after serving five years as a demonstrator in the botanical department, he was elected to a University lectureship. In 1912 he became tutor of St. John's, an appointment which he was able to hold with the University lectureship; and in the same year he married Joan, the second daughter of Mr. T. E. Bisdee, of Hutton Court, Somerset, by whom he had three children. From July, 1915, to July, 1917, he held a captain's commission in an officer cadet battalion at Cambridge, which he relinquished to join the 1st/6th Battalion of the Gloucestershire Regiment as a second-lieutenant. After about a fortnight in the front line he was gassed, and from the effects of this he never completely recovered; he was discharged from the Army in October of this year, and, though still far from well, resumed his college and university duties.

Mr. Gregory was one of a group of students who were stimulated by the teaching and enthusiasm of Prof. Bateson to take up different branches of genetics; it was mainly with cytological problems that his researches were concerned. He was the author of several papers, some of which were published in the Proceedings of the Royal Society in collaboration with Prof. Bateson. His most important contributions were those dealing with the genetics and cytology of giant races of Primula, published in the *Journal of Genetics* (1911) and in the Proceedings of the Royal Society (1914). His work demonstrated the striking fact that some forms of Primula exhibit the giant character not only in the plant-body as a whole, but also in the constituent cells. The results obtained constituted a definite advance in our knowledge of phenomena connected with the reduplication of certain terms in a series of gametes. His researches also included the investigation of heterostylism, habit, leaf-form, and flower colour in *Primula sinensis*, the seed characters of Pisum, reduction-division in ferns, forms of flowers in Valeriana, and other subjects.

Mr. Gregory was a good all-round botanist, who inherited from his mother (whose work on the genus Viola is well known to systematists) a love of natural history. He had already established for himself an honourable position as an original investigator, and those who knew him best looked forward with confidence to still greater achievements in the future. He was a man who would never grow old; he enjoyed life in the best sense, and endeared himself to undergraduates and older associates by his unselfishness and joyous, open-hearted character. His place will be hard to fill, particularly in these days when there is an exceptional need for virile teachers and men of wide and strong human sympathies.

A. C. SEWARD.

NOTES.

IN his speech at Wolverhampton on Saturday last the Prime Minister made a noteworthy declaration in regard to the application of science to agriculture—a declaration which would appear to adumbrate something more than a passive policy of commendation. "Scientific farming *must* be promoted," he said; and in another passage he spoke of utilising the capacity of the soil to a greater extent by the application of scientific principles. There is a certain vagueness in these statements, and until concrete proposals are put forward it is difficult to appraise their meaning and value. One obvious way of adding to the capacity of the soil would be to promote the use of artificial fertilisers, and, seeing that Mr. Lloyd George also spoke of the need for a "national supply of fertilisers," it seems probable that what he had in mind in speaking of scientific farming was the extended use of artificial manures. The suggestion—or is it a decision?—to have a national supply of fertilisers foreshadows a new departure in State policy of great import. It is to be hoped that in applying science to farming the Prime Minister will bear in mind the need for encouraging research in the sciences bearing on agriculture.

A DEPUTATION from the National Sea Fisheries Protection Association is to wait upon the Right Hon. R. E. Prothero, President of the Board of Agriculture and Fisheries, as we go to press, to urge that the evolution and general direction of a fisheries policy for the whole nation should be entrusted to a Minister of the Crown who will be able to give to the subject his undivided interest. The industry is of prime importance, and a strong case can be made out for the constitution of a separate Ministry to be concerned with its interests and development. Mr. Hoover, the United States Food Administrator, whom we welcome among us, has warned us time and again of the fact that for many years to come the world must go short of beef. The impending meat famine, he tells us, started in 1907. In meat-eating countries the population increased. The demand for meat rose; prices rose; stockmen yielded to the temptation, and slaughtered cows, heifers, and calves which should have been kept as *reproducteurs*. The herds have further been diminished by periods of drought in Argentina, Australia, and North America, and by internecine strife in Mexico and Europe. Whatever happens, we shall be short of meat for years to come. That is one ground on which the National Sea Fisheries Protection Association bases its claim for reform of the fisheries administration of this country. The other considerations are: that fishermen will not undertake the catching of fish—a herculean labour of unending toil—unless there is a good living to be made out of fishing; that their industry has been so disorganised during the war that nothing short of national assistance can save it; and (a self-evident proposition) that these islands must maintain their fishermen communities or "go under." Such, in brief, is the case which the association presents to the Government. It has been worked out in detail in a printed memorandum which we commend to the study of our readers. Copies can be obtained from the secretary of the association at Fishmongers' Hall, E.C.4. We wish well to the deputation and to Mr. Prothero. Meanwhile, we note that there is a great degree of unanimity in the demand of the industry for a central Ministry to supervise the work of the English and Scottish fisheries services, and that the fishermen of Canada, France, and Germany are demanding similar consolidation of effort from their respective Governments. Fishermen know their business, and there is a strong presumption that their demands are reasonable.

THE *Times* for November 25 gives an interesting forecast of the report of the Civil Aerial Transport Committee, which has now been presented to Parliament, but will not be published until the New Year. It will be remembered that this Committee was appointed in May, 1917, to consider the regulation of commercial air traffic and the possibility of employing existing machines and *personnel* for commercial purposes after the war. The Committee has divided itself into various sub-committees, dealing with various issues, and the main conclusions reached, as foreshadowed in the *Times*, are here summarised. With regard to the sovereignty of the air, it has been recommended that any country must exercise sovereign rights over the superincumbent air if commercial aviation is to be properly regulated and controlled. Such points as the qualifications for using aircraft, registration, and the problems arising in connection with damage caused by aircraft have been thoroughly discussed. In dealing with the possibilities of existing machines, four types have been considered, represented by the Handley-Page, the de Haviland, the R.E.8, and the Sopwith "Pup." The first two types are naturally the most interesting, being both capable of carrying considerable loads. The lighter machines may, however, be of much assistance to commercial activities in connection with the rapid transport of passengers and small quantities of goods.

THE Committee referred to above expresses the opinion that speed of aircraft is probably the chief factor for commercial success, especially for inland routes, where an express train service is available as an alternative. For isolated spots and sea passages speed will not be so important. A speed of 100 miles per hour is suggested, and this is sufficiently difficult to attain with heavy machines on account of the high landing speed involved, especially if the wing-loading is high. The Committee directs attention to this point, stating definitely that a high loading is a necessity for commercial success, and suggesting that a development of air-brakes or arresting devices may meet the difficulty. Night-flying is considered essential, particularly in relation to mail services, and the development of existing facilities should be encouraged. Those interested in commercial aeronautics will await with interest the publication of the full report, but the above brief remarks will suffice to show that the difficulties to be surmounted are considerable, and will tax the powers of designers to the utmost. The wonderful progress that has been made with military aircraft should prove a great stimulus, and if similar facilities for experimental research can be applied to the commercial problem, we may well look forward to a period of rapid development and success.

RAPID strides have been made by the Meteorological Office in weather knowledge during the progress of the war, and the information available for the newspaper Press is vastly superior now to that of four years ago. The rapid development of the Air Service has entailed a more minute study of the upper air, and facts of really scientific value are being secured. It is now suggested that the changes in atmospheric pressure at the earth's surface are controlled by the atmospheric pressure at the elevation of about five or six miles. Pilot-balloon observations are now made daily in many different parts of the British Isles, and these are charted for the several elevations up to 10,000 ft. or 15,000 ft. Since the weather has again become public information, the pilot-balloon observations have shown many points of interest. During the progress of a storm area on its north-easterly course to the westward of Ireland on November 20 the surface-wind at Valencia was travelling at twenty-nine miles an hour, whilst at 2000-ft. elevation it was travelling seventy miles an hour. On November 22, with a surface-wind of thirteen miles an hour, the rate per hour at 4000 ft. was fifty-three miles, the direction in both cases being south-easterly.

THE Registrar-General's return for the week ending November 16 shows a very decided decrease in the deaths in London from influenza, the number being 1665, while for November 9 it was 2433, a decrease of 768. At many places in the English provinces the complaint is still virulent, and the deaths show no abatement. The death incidence at the several ages is well maintained, the deaths between the ages of twenty and forty-five being 46 per cent. of the total, and the deaths below forty-five years being 77 per cent., whilst above forty-five years the percentage is only 23. Influenza was responsible for 49 per cent. of the deaths from all causes during the week, pneumonia for 14 per cent., and bronchitis for 7 per cent. For the whole six weeks of the epidemic influenza has caused 48 per cent. of the deaths from all causes, pneumonia 12 per cent., and bronchitis 6 per cent. Chicago, with nearly two-thirds of the population of London, had 571 deaths from influenza in the week ending October 12, when London had eighty deaths only, showing that the disease was rampant earlier in Chicago.

AN appeal has been issued by the president of the Royal Society of Antiquaries of Ireland, supported by representatives of other associations interested in Irish antiquities, on the subject of an inventory of the local archæological remains. The writers point out that the antiquities of Ireland possess more than local interest, and that in comparison with those of Great Britain they are more numerous. In recent years, owing to the changing conditions of land tenure, the abandonment of old superstitions, the imperfection of the system of local education, the extension of tillage, and other causes, much damage has been done to these monuments. It is pointed out that in 1908 three Royal Commissions were appointed for the purpose of making detailed inventories of the ancient monuments of England, Scotland, and Wales, as a result of which a large mass of important information has been collected and published. But, so far, no steps have been taken to institute a similar survey in Ireland, and an appeal by the Royal Society of Antiquaries and the Royal Irish Academy has been rejected. The request of this important body of antiquaries is clearly reasonable, and will, we have little doubt, receive hearty support from antiquaries in Great Britain.

IT has long been recognised that whilst the open fire is at once attractive, and furnishes practically the only means of ventilation of ordinary dwellings, its heat efficiency is remarkably low. The shortage of coal and its high price—the latter a legacy which will probably remain to the householder—furnish ample incentive to improve the efficiency of the domestic grate, but the replacement of even a small part of the number by more scientifically constructed appliances is obviously out of the question. Landlords will not go to the expense to save tenants' pockets, and tenants are equally averse to incurring expense which in most cases would benefit others. Means may, however, be found to improve the efficiency of existing grates, and Prof. C. V. Boys has invented an economiser in which the flue-gases are diverted on their way to the chimney through two upright cylinders, standing one on each side of the fireplace, each cylinder surrounding a concentric pipe which is open above and below. The flue-gases pass through the annular space thus formed on their way to the chimney, heating the inner tube and causing a current of warm air to be discharged into the room; also the surrounding air is warmed by contact with the exterior of the flue-gas chambers. The fire remains visible and radiates as usual. It is admitted that such a device is not altogether ornamental, but people may be willing to accept this disadvantage in view of the advantage of added warmth for a given consumption of fuel.

The death is recorded in *Science* of Prof. W. L. Hooper, head of the department of electrical engineering at Tufts College, Mass. Prof. Hooper had been a member of the faculty at Tufts for thirty-five years, and was acting president in 1912 and 1913.

The death is announced, in his seventy-fourth year, of Prof. William Main, formerly professor of chemistry in the University of North Carolina. Prof. Main was one of the pioneers in copper and lead mining in the United States. He invented the lead-zinc storage battery, and is said to have been the first to apply the storage battery commercially to the propulsion of street-cars. In recent years he had been chiefly employed as an expert in technical cases before the courts.

Lt.-Col. Llewellyn Longstaff, whose death at the age of seventy-seven is announced by the *Times*, was known to geographers chiefly for his generous support of Antarctic exploration. The funds for the projected national expedition were growing so slowly that there seemed little hope of enough being collected to equip even a modest expedition when in March, 1899, Col. Longstaff sent a contribution of 25,000*l.*, which, with contributions already in hand, guaranteed the sailing of the ship. Two years later the expedition sailed in the *Discovery* under Capt. Scott. Col. Longstaff also contributed to Capt. Scott's last expedition. Most of his life he devoted to business, and he was keenly interested in volunteering. For more than forty years he had been a fellow of the Royal Geographical Society, and served for some time on its council. His eldest son, Capt. T. G. Longstaff, is well known for his travels and explorations in the Caucasus, Himaláyas, and Tibet.

The success of the British Scientific Products Exhibition, held at King's College, London, during the past summer, has led the British Science Guild to decide to organise another exhibition next year. The main object of the new exhibition will be to stimulate national enterprise by a display of the year's progress in British science, invention, and industry. Further particulars will be available in due course. A large part of the recent exhibition has been transferred to Manchester, where it will be on view at the Municipal College of Technology in a few weeks' time.

The Cecil medal and prize of 10*l.* of the Dorset Field Club will be awarded in May next for the best essay on "explosives used in warfare from the time of the Crusades to the present war, giving details (unobjectionable from a military point of view) of each invention, and the chemical proportions of the substances used in each case, commencing with gunpowder and Greek fire." The competition is open to persons between the ages of seventeen and thirty-five on May 1, 1919, either born in Dorset or resident not less than a year between May 1, 1917, and May 1, 1919. Particulars are obtainable from Mr. H. Pouncy, Midland Bank Chambers, Dorchester.

The *Museum Journal*, published by the University of Pennsylvania (vol. ix., part 2, June, 1918), is largely devoted to a study of works of art from the Far and Nearer East. In primitive Chinese ritual bronze vessels were used to hold the food and drink offered to the spirits of the earth and air and the manes of departed ancestors. Two valuable specimens of this class of vessel, one belonging in all probability to a period well back in the first millennium before our era, the other dated during the twelfth or eleventh century B.C., are described. Of these the ornamentation, though bizarre, is singularly effective in conforming to the exigencies of the space to be covered. The Bronze age in China is believed to have drawn to a close about the middle of the first millennium before our era. For religious purposes, however, bronze continued to hold its own, and it was not for another millennium, or until the sixth or seventh century A.D., that the art of the bronze-worker may be said to have attained its apogee with the casting of those wonderful gigantic statues which characterised the religious enthusiasm prevailing in China of the Northern Wei (A.D. 386–535) and T'ang (A.D. 618–907) dynasties, of which the sole remaining example in the world to-day is the great Daibutsu at Nara, the ancient capital of Japan.

Further light on the respiration of larval dragonflies is afforded by Mr. Joseph H. Bodine in the Proceedings of the Academy of Natural Sciences of Philadelphia (vol. lxx., part 1). The author shows that these larvæ breathe by means of the rectum from the time of hatching until transformation. The so-called tracheal "gills" serve but as rudders during locomotion, and take no part in respiration, as is shown by the fact that they may be removed with impunity. That respiration takes place through the skin of the larva he regards as improbable, since any oxygen thus absorbed would be quite insufficient for respiratory purposes.

The significance of specific structural characters as between nearly related species is variously interpreted by evolutionists, who are prone, in discussing this theme, to neglect the work of the systematists who are providing an immense store of material for analysis. Larval characters are especially interesting in this regard, as will be manifest on a careful examination of the enlarged figures of the mouth-parts of tadpoles given by Dr. N. Annandale in his papers on "Some Undescribed Tadpoles from the Hills of Southern India" and on "The Tadpoles of the Families Randidæ and Bufonidæ Found in the Plains of India" in the Records of the Indian Museum (vol. xv., part 1).

As is well known, surgeons insert grafts of living bone to supply defects caused by destructive injuries, but there is a difference of opinion as to the fate of such bone grafts. The opinion most usually held is that they always die, and that they merely help recovery by supplying a framework which is invaded by neighbouring living-bone cells. The view that grafts are purely passive in their action is supported by experiments reported by MM. J. Nageotte and L. Sencert (*Comptes rendus*, October 21). So far as all forms of connective tissue are concerned, the authors find that grafts which have been preserved in formalin or alcohol for a month or more serve all the purposes of a living graft. The dead fibre of the graft unites with the living fibre of the host, so that the point of union cannot be detected. The authors excised from the common extensor tendon of a dog's foot a piece 2·5 cm. long, and stitched in its place a corresponding piece of tendon which had been kept in alcohol for a month. When the dog was killed three months later it was found that the dead graft had become so perfectly united with the original tendon that its position could be detected only by the marks of the stitches. It is unnecessary to emphasise the importance of these observations to military surgeons.

The Eskimo of Greenland have a term, "savssat," to denote the crowding of animals in large numbers into a small space. This phenomenon has been referred to by several writers on Greenland. Mr. M. P. Porsild, director of the Danish Arctic Station at Disko, has some notes on the subject from personal observations in Disko Bay in the *Geographical Review* for September, 1918 (vol. vi., No. 3). In the winter of 1914–15 the ice-covering began to form at the outer end of Disko Bay, and the inner parts were closed later. This resulted in many narwhals being caught at the head of the bay and in Waygat Sound. The Eskimo discovered belts of thin ice in which the narwhals had broken breathing-holes. Around these holes the Eskimo collected and slaughtered the animals as they appeared. Allowing for carcasses lost, Mr. Porsild calculates the total number of narwhals killed at two "savssats" at more than a thousand. It is interesting to note that Mr. Porsild, who has had good opportunities to judge, denies that the male narwhal uses his tusk to make breathing-holes in the ice. These, he insists, are made by the top of the head. Eskimo confirm this view.

The October issue of the *Journal of the Board of Agriculture* is essentially a women's work number, and gives an interesting survey of the great contribution made by women to the national food production effort of the past two years. Separate articles descriptive of various phases of the work of the Women's Branch of the Food Production Department are contributed by Miss Meriel M. Talbot, the Hon Mrs. Alfred Lyttelton, and Miss M. M. McQueen, the principal officers of the branch. The work of the women of Wales is described by Mrs. M. S. Roberts; the work of women's institutes by Miss G. Hadow, vice-chairman of the National Federation of Women's Institutes; whilst Miss S. C. Hamlyn contributes an interesting account of a successful Devon experiment in the running of a farm entirely by women. The series is prefaced by a very suggestive article by Sir Daniel Hall on the position of women in agriculture. The problem of providing suitable openings for the many trained women who are now determined to remain upon the land and take up farming as a career he believes can best be solved by large farms worked entirely by women upon co-partnership lines. The small holding he regards as too speculative for the woman with little capital, and demands, moreover, an expenditure of physical energy which is beyond the powers of the average woman. The return to the small-holder is probably no greater than can be secured for the individual woman worker on the large co-partnership farm, provided it is carefully selected and well managed. He suggests that a trial should be made with a farm of about five hundred acres, devoted mainly to fruit-growing and market-gardening. Estimates are given which indicate that with reasonable success, after making due provision for interest on capital, management, wages, and reserve, a surplus should be available for distribution which would raise the weekly wage from 25*s*. to 40*s*. The provision of living accommodation and social amenities for the women workers is considered, and suggestions are given for the establishment and organisation of a community system, including communal buildings and cottages.

We have received a copy of the first issue of the *South African Geographical Journal*, which is the publication of the South African Geographical Society formed last year at Johannesburg. The journal is edited by Mr. J. Hutcheon, of the School of Mines and Technology, who contributes an introductory article on the aims of the society. It is hoped "to raise the standard and to safeguard the interests of the subject and those teaching it, to encourage geographical research," and to arouse interest in geography in South Africa. The society has in view the institution of travelling scholarships and the organisation of long-vacation excursions to India, Australia, Europe, etc. The journal is mainly occupied with reports of lectures delivered before the society, but contains an important article by Prof. J. W. Bews on "South African Phytogeography." The author gives the characteristics and distribution of fifteen types of vegetation, which he suggests as the basis of a botanical map of South Africa.

In the *Scientific American* for October 12 Mr. E. C. Horst describes a new industry which has sprung up in California with the support of the American Government. This is the drying of vegetables for export. It is done by placing slices of cleaned fresh vegetables, grown in the vicinity, on perforated trays packed in a room through which a current of warm, dry air is driven by fans. This slowly extracts the 65 to 85 per cent. of moisture the vegetables contain without, it appears, destroying their flavour when water is afterwards added to them. The dried vegetables are packed in cartons and tins of about 10 lb. weight. Millions of these tins have been sent to France, and one of the establishments on the Pacific coast now employs several thousand persons.

The Board of Science and Art, New Zealand, has decided on the bi-monthly publication of a *New Zealand Journal of Science and Technology*, together with additional bulletins in which papers too long for the ordinary journal will appear. This is an extension of the scheme authorised by the Government for the co-ordination of all papers and reports of a scientific nature. Already the official issues include the *Journal of Agriculture*, and bulletins and palæontological bulletins of the Geological Survey Department, and the bulletins of the Dominion Museum. The first of the new series of bulletins records the investigations of H. Rands and W. O. R. Gilling, national research scholars of the Canterbury University College, Christchurch, on the use of New Zealand brown coals, of which Prof. Park estimated the reserves at 521,000,000 tons, and of which only about 13,000,000 tons had been mined to the end of 1913. The two sections of Bulletin I. deal with the use of these brown coals in gas producers and the products yielded by low-temperature distillation.

A pamphlet describing the Fahy permeameter has been received from Mr. E. H. Alexander, of Coleshill Street, Birmingham, who is the agent for their sale in this country. The great commercial importance of a knowledge of the magnetic qualities of samples of iron and the time and labour involved in testing them by the standard ring method has led to the invention of numerous permeameters. Searle's magnetic square was one of the earliest types, and modifications of Ewing's yoke method have been extensively used. The Burrows permeameter has been officially adopted by the American Society for Testing Materials. In the Fahy permeameter we have an **H**-shaped piece of iron, the magnetising coil surrounding the horizontal bar, and the magnetic flux returning by the two gaps at the top and bottom of the vertical lines. One of these gaps is spanned by the sample steel bar to be tested, and the magnetising forces across this sample and across the remaining air-gap are adjusted by means of compensating and test coils until they have the same value. Hence the magnetising force on the bar—which is always the difficult thing to measure—can be found. The magnetic induction is measured in the ordinary way by reversing the current in the magnetising coil and noting the deflection produced on a ballistic galvanometer in series with a search coil. It would appear from the tests made by the U.S. Bureau of Standards that the accuracy of the permeameter is of the order of 5 per cent. Since the magnetic properties of a strip of transformer steel usually vary by this amount at different parts along its length, the accuracy obtained is satisfactory. So far as we know, however, the Drysdale permeameter is the only one that professes to test the magnetic properties at different parts of a large block of iron. In this a special tool is used to bore into the iron, so that parts of it can be tested *in situ.*

The line of the New Zealand Government railways between Christchurch and Timaru is the easiest stretch in New Zealand; it is straight and almost level for nearly the whole distance, but express trains frequently involve loads of more than 400 tons behind the tender, and the prevalent north-west gales make flange resistance heavy. The gauge is 3 ft. 6 in., and the trains were formerly worked by four-cylinder balanced, compound locomotives of the Pacific type. *Engineering* for November 22 contains an illustrated account of some new non-compound engines for this service, designed by Mr. H. H. Jackson, chief mechanical engineer. Superheated steam of 180 lb. per sq. in. pressure is used, with 54-in. coupled wheels and 17 in. by 26 in. cylinders. The valve gear is of the Walschaert type, with piston valves. The new engines have been tested against the best compound engines available, and show a saving of 20 per cent. in water and 33 per cent. in coal, including coal used in making up the fire each morning and during the two hours' stand over at Timaru. Part of the saving is undoubtedly due to the boiler, which is easily the best steaming boiler seen on a locomotive in New Zealand, and of this saving part again is directly due to superheating. The records of the hauling performances are also very good.

The current issue of Mr. C. Baker's quarterly list of second-hand instruments for sale or hire will repay careful examination by scientific workers. The catalogue contains descriptions of more than 1500 pieces of scientific apparatus, nearly all of which can be examined at 244 High Holborn, W.C.1. Great prominence is given in the list to microscopes and accessories, astronomical and terrestrial telescopes, theodolites, spectroscopes, projection and photographic apparatus, as well as to general physical apparatus.

OUR ASTRONOMICAL COLUMN.

Comets: Wolf's and Borrelly's.—Ephemeris of Wolf's comet for Greenwich midnight:—

		R.A.			S. Decl.		Log r	Log Δ
		h.	m.	s.	°	′		
Dec.	2	22	19	27	2	53	0·2003	0·1204
	6	22	30	22	3	17	0·1996	0·1294
	10	22	41	26	3	36	0·1994	0·1367
	14	22	52	34	3	51	0·1992	0·1480
	18	23	3	47	4	1	0·1995	0·1576
	22	23	15	2	4	6	0·2000	0·1672
	26	23	26	19	4	8	0·2008	0·1769
	30	23	37	34	4	5	0·2019	0·1867

The comet reaches perihelion on December 13, but, owing to its increasing distance from the earth, it is not likely to be brighter than the 12th or 13th magnitude.

The following is an approximate ephemeris of Borrelly's comet for Greenwich midnight:—

		R.A.			N. Decl.		Log r	Log Δ
		h.	m.	s.	°	′		
Dec.	4	7	3	13	31	46	0·1497	9·6795
	8	7	3	2	36	20		
	12	7	2	12	40	45	0·1545	9·6832
	16	7	0	35	44	59		
	20	6	58	5	48	55	0·1610	9·7043
	24	6	54	11	52	25		
	28	6	49	50	55	29	0·1687	9·7382

The comet is less than half an astronomical unit from the earth during the first half of December. It should be an easy object in small telescopes. The high north declination renders the comet observable throughout the night.

The Orbit of 83 Aquarii.—For the second time Dr. R. G. Aitken has deduced the orbit of a visual binary star, all the work on which, including the discovery and measurers, has been carried out by himself (Lick Observatory Bulletin No. 317). The star in question is 83 Aquarii (=A 417), and was noted as a close pair with components of equal brightness in 1902. Until 1912 the angular motion was nearly uniform, but in the last few years the motion has been extremely rapid, and the apparent distance so small as to make the pair difficult to measure even in the 36-in. telescope. The provisional elements of the orbit, with their computed probable errors, are as follows:—

$P = 23{\cdot}82 \pm 1{\cdot}37$ years
$T = 1917{\cdot}68 \pm 0{\cdot}20$ year
$e = 0{\cdot}404 \pm 0{\cdot}016$
$a = 0{\cdot}245'' \pm 0{\cdot}005''$

$\omega = 261{\cdot}3^\circ \pm 5{\cdot}4^\circ$
$i = \pm 56{\cdot}35^\circ \pm 4{\cdot}1^\circ$
$\Omega = 21{\cdot}6^\circ \pm 2{\cdot}4^\circ$

The Spectrum of Nova Aquilæ.—An important contribution to the spectroscopic study of Nova Aquilæ has been made by Dr. J. S. Plaskett, who has obtained a large number of photographs with a single-prism spectrograph attached to the new 6-ft. reflecting telescope of the Dominion Astrophysical Observatory at Victoria, B.C. (Journ. R.A.S. Canada, vol. xii., p. 350). Some of the photographs are remarkable for their great extension into the ultra-violet, as many as nineteen lines of the hydrogen series having been measured on June 19. The description of the changes recorded agrees closely with the accounts given by other observers. A change towards the nebular stage was noted on June 20, when the lines 5007, 4685, and 4363 began to show, and on July 11 the nebular stage was strongly marked. The displacement of the first set of hydrogen absorption lines increased at Hγ from 20·5 A on June 10 to 25·4 A on June 24, and from June 10 to June 15 there was a second set having a displacement of 33 A to the violet at Hγ. The measured positions of these lines agree with the positions computed by Balmer's formula when the constant is changed from 3646·13 to 3625·78 for the first and to 3618·4 for the second component on June 15. The positions of some sixty-five metallic lines, identified chiefly as enhanced lines of Ti, Fe, Cr, Sr, Sc, and V, were measured on the spectra from June 10 to June 15, and it has been shown that the displacements of these were also proportional to the wave-length, and were exactly the same as those of the hydrogen absorption lines. Dr. Plaskett considers it more likely that the displacements are due to some physical cause acting in the same manner on the molecules of all the elements involved than to velocity.